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ORIGINAL ARTICLE

Evaluation of primary health care service participation in the National Tuberculosis Control Program in Menofya Governorate

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Abstract To evaluate the primary health care (PHC) services performance in National Tuberculosis Control Program (NTP) in Menofya Governorate this study was created.

Methods: A questionnaire based on 6 parameters was used to evaluate the PHC system performance: I – Physicians basic knowledge about TB (causative agent, methods of spread, clinical picture, essential steps in investigations: X-ray and sputum smear). II – Facilities for primary investigation (sputum examination and chest X-ray). III – Communication with the central health authorities or a TB specialist. IV – Proper recording systems needed for proper patient management and follow up. V – Follow up schedules available for the detected/recorded patients. VI – Role in community education about the disease.

Results: The studied area included 10 health territories and 46 primary health care units (34.8% were urban and 65.2% were rural) with one physician in each unit. The mean percent of the correct answers of the basic knowledge score was 54.5% and was higher in rural units physicians than urban units physicians. There were lack of proper facilities (laboratory for sputum analysis and X-ray apparatus), and availability of DOTS in 32 units (69.6%). Communication with central health authorities in urban areas and rural areas was nearly equal (87.5–86.7%). Case recording was lower in urban than rural areas (6.25% vs. 43.3%). Patient follow up after referral to central health units was higher in rural than urban areas (23.3% vs. 6.25%). Participation in community education was higher in rural than urban areas (80% vs. 20%).

Conclusion: In the Menofya Governorate, PHC physicians lack proper knowledge about TB and their units lack proper equipment. The PHC system needs to be empowered by the health care authorities through training and equipment for better performance in NTP.

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Introduction

World Health Organization (WHO) Stop TB Strategy explicitly acknowledges that effective and sustainable TB control relies on the general health care system, especially on well-functioning primary health care (PHC) as weak health systems pose many barriers to effective TB control [1]. PHC providers should follow the regulations within their country. Since PHC providers are the first contact with persons seeking medical help, good communication with PHC services can be very useful in detecting and treating patients with tuberculosis (TB). Initial suspicion of TB most frequently occurs at the PHC level and when a PHC provider encounters a patient with symptoms indicating TB, he or she should examine the patient, take a medical history, and order sputum smear examination and chest X-ray or refer to a provider who can carry out these steps [2].

This study was done aiming at evaluation of the participation of primary health care service in National Tuberculosis Control Program in Menofya Governorate.

Methods

The studied area (Menofya Governorate) includes 10 health territories.

According to the Egyptian NTP [3] and WHO European region guidelines [4], the PHC system should have: I – Physicians with basic knowledge about TB (causative agent, methods of spread, clinical picture, essential steps in investigations: X-ray and sputum smear). II – Facilities for primary investigation (sputum examination and chest X-ray) III – Communication with the central health authorities or a TB specialist. IV – Proper recording systems needed for proper patient management and follow up. V – Follow up schedules for the detected patients. VI – Role in community education about the disease.

In the light of the above guidelines, this study evaluated these 6-parameters to check if PHC units have met the required criteria using the following questionnaire system:

A – The basic knowledge is assessed through 11 questions, giving 1 for a positive answer and 0 for a negative or inconclusive one. These questions and positive answers were

1. What is tuberculosis? (Infectious disease of the lung caused by tubercle bacilli characterized by lung destruction and fibrosis). 2. What is the causative agent? (*Mycobacterium tubercle* bacilli). 3. What are the types of TB? (Pulmonary and extra-pulmonary). 4. What are the methods of spread? (Droplet, cough and sneezing). 5. What are the main symptoms? (Cough expectoration, hemoptysis, fever and sweating especially at night). 6. What are the main signs? (General: weight loss and fever and local: consolidation or fibrosis in upper lobes with or without cavitation). 7. How to suspect extra-pulmonary TB? (Enlarged cervical lymph nodes, chronic skin ulcers, spine deformity or cold abscesses). 8. What will you do if you suspect a pulmonary TB case? (Sputum analysis for acid fast bacilli, chest X-ray and referral to specialist or central hospital).

9. What are the main signs in X-ray? (Upper lobe infiltration, fibrosis with or without cavitation). 10. If sputum smear is negative and X-ray suggestive of TB, what will you do? (Refer to a central chest hospital or a specialist). 11. What are the main drugs used in treatment? (INH, Rifampicin, Pyrazinamide, Ethambutol and Streptomycin).

B – Facilities for case detection and treatment

Does a working lab for sputum smear exist? (Yes; 1 – No; 0). Does a working X-ray apparatus exist? (Yes; 1 – No; 0). DOTS application exists? (Yes; 1 – No; 0).

C – Have a communication with central health authorities or a TB specialist? (Yes; 1 – No; 0)

What are the methods of communication? (Phone, net or send patients with reports). What are the types of health authorities? (Ministry of health related hospitals such as Central Teaching, chest, fever hospitals or University hospitals).

D – Have proper recording systems for proper patient management and follow up? (Yes; 1 – No; 0)

The minimum recorded items required: Name – Age – Sex – Address – Registration Number – Referral site – How suspected (signs and symptoms) – Sputum and CXR results – Diagnosis – treatment given – Follow up and outcome.

E – Do you follow up patients after referral to central health units? (Yes; 1 – No; 0)

How do you make follow up? – By phone, by visits to the patient or by patient visit to the primary care units.

D – Role in community education

- Are there any ways to communicate with and educate the public about TB? (Yes; 1 – No; 0).
- Where do you make these communications? (At the primary care units, Youth clubs and collections or during infectious disease prevention campaigns).

Statistical analysis

Collected data were analyzed using SPSS software, version 16 (Spss Inc, Chicago, IL). Categorical data were presented as numbers and percentages while quantitative data were expressed as mean and standard deviation. Chi square test, or Fisher's exact test, Spearman's correlation coefficient (rho) and Mann–Whitney U test were used as tests of significance. The accepted level of significance in this work was stated at 0.05 ($P < 0.05$ was considered significant). P value > 0.05 insignificant, $P < 0.05$ significant and $P < 0.001$ highly significant.

Results

The studied area included 10 health territories and 46 primary care units (centers) with one physician in each unit. Urban territories comprised 16 units (34.8%) while rural territories comprised 30 units (65.2%). Only 40 patients were recorded in all units (Table 1). The % of the correct answers of the basic knowledge score ranged from 18% to 81%, with a mean of

Table 1 Characteristics of the studied areas.

Variable	No.	%
Health territories	10	100
Primary care units/centers	46	100
Physicians	46	100
TB patients	40	100
Urban units	16	34.8
Rural units	30	65.2

Table 2 Basic knowledge of the studied physicians about TB (percentage of the correct answers) as a whole.

Mean value of correct answers	54.5%
SD ±	16.3%
Minimum	18.0%
Maximum	81.0%

54.5 ± 16.3% (Table 2). Physicians in rural areas have higher scoring in basic knowledge than physicians in urban areas, although the difference is not significant (Table 3). There was no working lab for sputum analysis in all studied health units/centers, while there were working X-ray apparatus only in 7 units (15.2%) and availability of DOTS in 32 units (69.6%) (Table 4). Communication with central health authorities in Urban and rural areas was nearly equal (87.5–86.7%) while case recording was lower in urban than rural areas (6.25% vs. 43.3%). Patients follow up after referral to central health units was higher in rural than urban areas (23.3% vs. 6.25%). Participation of community education about TB was higher in rural than urban areas (80% vs. 20%) (Table 5).

Discussion

Egypt has succeeded to achieve the global target in TB control occupying a place in the target zone [5]. To have a better place in the target zone, TB control program must apply international guidelines in TB control including the start up at primary health care services. Primary health care (PHC) is the first level of contact of individuals, the family and community with the national health system. PHC brings health care as close as possible to where people live and work, and constitutes the first component of a continuing health care process [4]. The aim of this work was to evaluate the primary health care service performance in National Tuberculosis Control Program in Menofya Governorate.

Table 3 Basic knowledge of the studied physicians according to area of working (rural vs. urban).

Area	Knowledge score			
	M	SD ±	St. "t"	*P*
Rural	55.2	18.72	0.37	0.71
Urban	53.3	10.91		

Table 4 Facilities for case detection in the studied health units/centers.

Variable	No. (N = 46)	%
Working lab for sputum smear	0	0.0
Working X-ray apparatus	7	15.2
Availability of DOTS	32	69.6

The studied area includes 10 health territories and 46 primary care units (centers) with one physician in each. Urban territories comprised 16 centers (34%) and rural units comprised 30 units (65.2%) with only 40 TB patients being recorded in all. In a similar study by Essayed et al., in Qalyubia Governorate they found 8 health territories and 40 primary care units (centers) with one physician in each with 139 TB patients [6]. Although there is no golden rule that can be invoked with respect to the rate of doctors available to the population, WHO considered that countries that have less than 23 doctors for every 10,000 people likely will not be able to achieve coverage rates of adequate primary health care services, according to the strategic priorities of the Millennium Development Goals. While confirming the actual indicators of the organization that this rate up to an average of 13 doctors per 10,000 people (with considerable variation between countries) being acceptable, the rate of coverage in Africa is two doctors only versus 32 doctors for every 10,000 people in Europe [7]. According to the central agency for public mobilization and statistics deployment of health services in Egypt, the average number of doctors per 10,000 people was 10.2. This lower number of physicians in primary care units is far away from giving adequate services in TB control.

In our study, basic knowledge of the studied physicians about TB (the percent of the correct answers of TB questionnaires), ranged from 18% to 81%, with a mean of 54.5% which is too variable while qualification and training of PHC physicians should be similar whatever the place. Essayed et al., found that the correct answers of TB questionnaire ranged from 18% to 100%, with a mean of 48.2% [6], which is in agreement with our finding. This also points to the lack of intention from Egyptian Ministry of Health for PHC physicians' qualification which is a serious defect in TB control. In the present study, the basic knowledge of the studied physicians according to area of working (rural vs. urban) revealed that physicians in rural areas have higher scoring in basic knowledge than physicians in urban areas, although the difference is not significant (55.2% vs. 53.3%). Essayed et al., found physicians in urban areas in Qalyubia Governorate to have higher scoring in their basic knowledge than physicians in rural areas, (55.4% vs. 44.3%) [6], which disagree with our finding. Being all PHC physicians belonging to one health authority, this discrepancy indicates the shortage in continuous medical education of PHC physicians although some areas do well. Being in one country, PHC physicians whether in rural or in urban areas must have a standard qualification and if possible, higher qualification for PHC in rural areas where TB cases are much more common and resistance is more prevalent [8].

In the present work, the facilities for case detection in the studied health units/centers revealed that there was no working lab for sputum analysis in all studied health units/centers, availability of DOTS was present in 32 units (69.6%) and there

Table 5 Communication with central health authorities, case recording, patient follow up and participation in community education in studied area urban versus rural.

Variable		Area						X^2/Fisher's	P
		Rural (N = 30)		Urban (N = 16)		Total (N = 46)			
		No	%	No	%	No	%		
Communication with central health authorities	No	4	13.3	2	12.5	6	13.1	–	0.63
	Yes	26	86.7	14	87.5	40	86.9		
Case recording system	No	17	56.7	15	93.75	32	69.6	–	0.035
	Yes	13	43.3	1	6.25	14	30.4		
Follow up patient after referral to central health units	No	23	76.7	15	93.75	38	82.6	–	0.85
	Yes	7	23.3	1	6.25	8	17.4		
Participation in community education	No	6	20	11	68.75	17	36.9	8.81	0.003
	Yes	24	80	5	31.25	29	63.1		

were 7 working X-ray apparatuses (15.2%) in all studied health units/centers. In Qalyubia Governorate there was no working lab for sputum analysis, or any working X-ray apparatus in all studied health units/centers, but DOTS was available in all [6]. Availability of diagnostic tools for new cases of TB especially X-ray and sputum smear examination by Zeihl Nielsen stain can, to a great extent, participate actively in TB control. Being the 1st person faced with a TB case, PHC physician is able to diagnose cases early by doing smear staining for acid fast bacilli which is the surest way for diagnosis and X-ray chest as the classical picture of TB in X-ray (upper lobe infiltration with cavitation) still the one most commonly seen in new cases [9]. Even if smear is negative, X-ray picture can help referral of the case to a central health authority where facilities for further investigations are available so that the case does not escape early diagnosis [10]. Lack of such simple diagnostic tools in primary care will delay diagnosis, helping spread and development of resistance in TB cases which cause a great cost and hazard in managing such cases with delayed diagnosis [11]. The absence of such simple diagnostic tools and personnel trained on their use in Menofya Governorate reflects another big defect in disease control. According to CDC [12] and WHO [13], radiology services include access to radiograph equipment, trained radiograph technicians, and radiograph interpretation by a qualified person. Radiograph findings and reports should be available within 24 h. Laboratory services should also be readily accessible to perform and provide results of AFB smear examinations within 24 h of specimen collection. TB prevention and control programs should work closely with laboratories to ensure the rapid delivery of specimens to the laboratory and prompt reporting of AFB smear results, culture results, and results of drug-susceptibility tests to the clinician and health department. Laboratory services should also be available to provide monitoring of bacteriologic response to therapy.

In the present study, communication with central health authorities or a TB specialist was present in 89.1% and absent in 10.9% and was nearly equal in urban and rural areas (87.5% vs. 86.7%). In Qalyubia Governorate communication with central health authorities was higher in urban areas than rural areas (65.4% vs. 57.1%), communication with central health authorities or a TB specialist was present in 62.5% and absent in 37.5% [6]; such results disagree with ours. These findings depict a shortage in TB control program in the governorate PHC units. According to WHO [14], expert medical consultation in TB should be available to the health care community, especially for patients who have drug resistant disease or medical problems that might affect the course or the outcome of treatment. PHC physicians must communicate both with patients to emphasize that TB is a curable condition and to stress the importance of regular follow up during treatment as well as with specialized health authorities to be aware of patients who were referred for diagnosis and treatment [15]. Absence of communication with central health authorities in large numbers of PHC units in Menofya Governorate constitutes a big defect in TB control in the locality and reflects lack of follow up of central health authorities and needs strict and rapid interventions.

In this work, case recording was lower in urban than rural areas (6.25% vs. 43.3%). Only 14 of 46 PHC in studied 10 territories have a recording system (30.4%) with marked variation between units in the same territory. This may be explained by the fact that the recording system is mainly done by nurses who are not followed up by the territory authority with another factor which could be the absence of financial incentive to nurses for their extra-duty. In Qalyubia Governorate case recording was lower in urban than rural areas (42.9% vs. 46.2%) with only 18 of 40 PHC (45%) in the studied 8 territories have a recording system with marked variation between units in the same territory [6]. Defect in case recording in PHC in both Menofya and Qalyubia and may be other governorates reflect how the gap is in TB management. Case recording is an essential part of TB control program both internationally and locally. Case recording with essential data about resistance and methods of communication with patients as well as type of the disease, pulmonary or extra-pulmonary, sensitive or resistant and if the later, mono or multi-drug resistant. Patients data help close follow up and avoid losing them for a long time so that proper interventions could be taken [3]. Again lack of recording systems for diagnosed TB cases constitutes a big fault in TB control in the Menofya Governorate as well as lack of follow up from central health authorities. TB control programs should maintain a computerized record system (case registry) with up-to-date information on all current clinically active and suspected TB cases in the community to ensure follow-up of all TB patients and those persons suspected of having TB, registry information (e.g., smear, culture, and susceptibility results; clinical status; chest radiograph results; and doses of medications being administered) should be obtained and updated on a continuing basis [16].

In this work patient follow up after referral to central health units was found in 8 units (17.4%), this is almost due to lack of awareness about the importance of patients follow up and constitutes a big gap in which good TB control sinks and fails because one of the important roles of PHC in NTP according to WHO treatment guidelines is patient follow up [1]. In Qalyubia Governorate 4 of 40 units in the studied 8 territories (10%) have patient follow up after referral to central health units with marked variation between units in the same territory which agree with our finding [6]. Like the defect in case recording, defect in case follow up in PHC units constitutes a great shortage in TB control in both governorates. Lack of patient follow up is one of the important factors that lead to treatment defaulting in TB because patients misunderstand stopping follow up as an indication of or failure to cure, both of which force patients to stop their treatment. Follow up of patients give them a direct clue of the importance of their treatment and includes continuous encouragement to complete and to change medication as required when side effects develop while in contact with central health authorities. This follow up is stressed in all TB control programs given by WHO or national authorities [17]. Physicians in PHC units complain as they did not get any training from health authorities in the territories about TB which makes them unable to deal with TB patients. They also were frequently replaced and not kept in their units for sufficient periods of time so they do not care about follow up of patients. In this study, the participation of community education about TB was higher in rural than urban areas (80% vs. 20%).

Participation in community education about TB was practiced in 28 units (60.9%). In Qalyubia Governorate [6] participation in community education was practiced in 31 units (77.5%) and was nearly equal between rural and urban units (76.9% vs. 78.6%) which agree with our finding. TB, like other infectious diseases, can be controlled when awareness about transmission in the community is high. Increased awareness about TB and contribution of the community in TB control are essential [18]. Contacts of the patient are susceptible to infection [19] so, education of patient family for proper home ventilation, avoidance of direct exposure to patients' air droplets on coughing and disinfection methods is essential [20]. Vasquez-Campos et al. [21] recorded that the NTP designed its communication component to help achieve its overall goal of detecting 70 percent of infectious TB cases and treating 85 percent of them. These program objectives also became the goals of the communication strategy. The NTP used communication to address several issues that challenged the program which are essentially the job of PHC services. These issues included: communication goals, communication activities, impact, reducing stigma about the disease especially among health care workers, introducing an enabling environment for case detection and cure, gaining support from political, governmental, international and local leaders for the program, raising awareness about TB in general, including the effectiveness of treatment and that diagnosis and treatment were available at no cost, improving knowledge about TB case detection, encouraging those with symptoms to seek help, strengthening the link between health facilities and the community to improve case detection and treatment success. Also these measures improve both passive and active case identification by building health care workers' capacity to approach and counsel patients and by increasing community involvement in detecting new cases, improving compliance with treatment by motivating patients and supporting volunteers, family members, and the community, reaching high-risk groups, particularly the urban poor areas and reaching "closed population" groups with high TB prevalence, such as those living in prisons, mental institutions, retirement homes, and homeless shelters.

From the above, it appears that PHC services in Menofya Governorate (and possible in other governorates) suffer great defects that need correction for the national TB control program to be effective.

Conclusion

In Menofya Governorate, PHC physicians lack proper knowledge about TB and their units lack proper equipment (Lab and CXR). There was a low communication between PHC providers and the central health authorities, with lack of proper recording and follow up of cases. The PHC system needs to be empowered by the health care authorities through training and equipment for better performance in NTP.

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